

CLAIMS

What is claimed is:

1. A tool for embossing high aspect ratio microstructures in an optical coating comprising:
 - a plurality of high aspect ratio etch features,
wherein the high aspect ratio etch features are pressed against an optical coating to form a high aspect ratio microstructure.
2. The tool of Claim 1, wherein the tool is fabricated from a metal.
3. The tool of Claim 2, wherein the metal is electroformed over a substrate.
4. The tool of Claim 1, wherein the aspect ratio is greater than approximately 5 to 1.

5. A tool for embossing high aspect ratio microstructures made by the process of:

- (a) etching a plurality of high aspect ratio columnar pits in a substrate;
- (b) etching the high aspect ratio columnar pits into relatively pointed obelisks, thereby forming etch features; and
- (c) electroforming a metal on the etch features.

6. The method of Claim 5, wherein the etching of high aspect ratio columnar pits further comprises inductively coupled plasma etching.

7. The method of Claim 5, wherein the etching of high aspect ratio columnar pits further comprises anisotropic reactive ion etching.

8. The method of Claim 5, wherein the etching of relatively pointed obelisks further comprises isotropic reactive ion etching.

9. The method of Claim 5, wherein the etching of relatively pointed obelisks further comprises isotropic liquid etching.

10. The method of Claim 5, wherein the substrate is silicon.

11. The method of Claim 5 further comprising the step of vapor depositing a conductive layer on the substrate before electroforming a metal on the etch features.

12. The method of Claim 5 further comprising the step of rinsing the substrate after the forming of etch features.

13. The method of Claim 5, wherein the aspect ratio is approximately greater than 5 to 1.

14. A tool for embossing high aspect ratio microstructures in an optical coating made by the process of:

- (a) inductively coupled plasma etching a plurality of high aspect ratio columnar pits in a silicon substrate;
- (b) reactive ion etching the high aspect ratio columnar pits into relatively pointed obelisks, thereby forming etch features;
- (c) rinsing the silicon substrate;
- (d) vapor depositing a conductive layer on the silicon substrate;

and

- (e) electroforming a metal on the etch features.

15. The process of Claim 14, wherein the aspect ratio is greater than 5 to 1.